

**BEFORE THE
PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA**

DOCKET NO. 2021-1-E

In the Matter of)
Annual Review of Base Rates for Decrease in)
Residential and Lighting Customer Fuel Costs)
and for Increase in General Service Non-)
Demand and General Service Demand)
Customer Fuel Costs for Duke Energy)
Progress, LLC)

**DIRECT TESTIMONY
OF BRYAN P. WALSH FOR
DUKE ENERGY PROGRESS, LLC**

1 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is Bryan P. Walsh and my business address is 526 South Church Street, Charlotte,
3 North Carolina 28202.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 A. I am Vice President of Central Services and Organizational Effectiveness for Duke Energy
6 Business Services, LLC (“DEBS”). DEBS is a service company subsidiary of Duke Energy
7 Corporation (“Duke Energy”) that provides services to Duke Energy and its subsidiaries,
8 including Duke Energy Carolinas, LLC (“DEC”) and Duke Energy Progress, LLC (“DEP” or
9 the “Company”).

10 **Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL**
11 **BACKGROUND.**

12 A. I graduated from The Catholic University of America with a Bachelor of Mechanical
13 Engineering degree. I also graduated from the Georgia Institute of Technology with a Master
14 of Science in Mechanical Engineering. I am a registered Professional Engineer in the State
15 of North Carolina. My career began with Duke Energy as part of Duke / Fluor Daniel in 1999
16 as an associate engineer assisting in the design and commissioning of new combined-cycle
17 power plants. I transferred to Duke Power in 2003 and worked in the Technical Services
18 group for Fossil-Hydro. Since that time, I have held various roles of increasing responsibility
19 in the generation engineering, operations areas, and project management, including the role
20 of technical manager at DEC’s Marshall Steam Station, and also station manager at Duke
21 Energy Indiana’s Gallagher Station & Markland Hydro Station. I was also the Midwest
22 Regional Manager from 2012 to 2015, with overall responsibility for the Midwest Gas
23 Turbine Fleet and various coal-fired facilities in Indiana and Kentucky. I was named General

1 Manager for Outages & Projects in the Carolinas in 2015. Next, I became the General
2 Manager of Fossil-Hydro Organizational Effectiveness in 2017. I assumed my current role
3 in 2019.

4 **Q. WHAT ARE YOUR DUTIES AS VICE PRESIDENT OF CENTRAL SERVICES**
5 **AND ORGANIZATIONAL EFFECTIVENESS?**

6 A. In this role, I am responsible for providing engineering, environmental compliance planning,
7 generation and regulatory strategy, technical services, and maintenance services, for Duke
8 Energy's fleet of fossil, hydroelectric, and solar (collectively, "Fossil/Hydro/Solar") facilities.

9 **Q. HAVE YOU TESTIFIED BEFORE THIS COMMISSION IN ANY PRIOR**
10 **PROCEEDINGS?**

11 A. Yes, I testified in DEP's 2018 fuel costs proceeding in Docket No. 2018-1-E.

12 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?**

13 A. The purpose of my testimony is to (1) describe DEP's Fossil/Hydro/Solar generation portfolio
14 and changes made since the 2020 fuel cost recovery proceeding, as well as those expected in
15 the near term, (2) discuss the performance of DEP's Fossil/Hydro/Solar facilities during the
16 period of March 1, 2020 through February 28, 2021 (the "review period"), (3) provide
17 information on significant Fossil/Hydro/Solar outages that occurred during the review period,
18 and (4) provide information concerning environmental compliance efforts.

19 **Q. PLEASE DESCRIBE DEP'S FOSSIL/HYDRO/SOLAR GENERATION**
20 **PORTFOLIO FOR THE REVIEW PERIOD.**

21 A. The Company's Fossil/Hydro/Solar generation portfolio consists of 8,868 MWs of generating
22 capacity, made up as follows:

23 Coal-fired - 3,143 MWs

1	Combustion Turbines -	2,408 MWs
2	Combined Cycle Turbines -	3,054 MWs
3	Hydro -	228 MWs
4	Solar -	35 MWs ¹

5 The 3,143 MWs of coal-fired generation represent two generating stations and a total
6 of five units. These units are equipped with emission control equipment, including selective
7 catalytic reduction (“SCR”) equipment for removing nitrogen oxides (“NO_x”), flue gas
8 desulfurization (“FGD” or “scrubber”) equipment for removing sulfur dioxide (“SO₂”), and
9 low NO_x burners. This inventory of coal-fired assets with emission control equipment
10 enhances DEP’s ability to maintain current environmental compliance and concurrently
11 utilize coal with increased sulfur content – providing flexibility for DEP to procure the most
12 cost-effective options for fuel supply.

13 The Company has a total of 24 simple cycle combustion turbine (“CT”) units, the
14 larger 14 of which provide 2,148 MWs, or 89% of CT capacity. These 14 units are located at
15 the Asheville, Darlington, Richmond County, and Wayne County facilities, and are equipped
16 with water injection and/or low NO_x burners for NO_x control. The 3,054 MWs shown as
17 “Combined Cycle Turbines” (“CC”) represent six power blocks. The two Asheville
18 Combined Cycle (“Asheville CC”) power blocks have a configuration of one CT and one
19 steam turbine. The CT of the second Asheville CC power block came on-line in January
20 2020, and the steam turbine component came on-line in April 2020. The H.F. Lee Energy
21 Complex CC power block has a configuration of three CTs and one steam turbine. The two

¹ This value represents the relative dependable capacity contribution to meeting summer peak demand, based on the Company’s integrated resource planning metrics. The nameplate capacity of the Company’s solar facilities is 141 MWs.

1 Richmond County power blocks located at the Smith Energy Complex consist of two CTs
2 and one steam turbine each. The Sutton Combined Cycle at Sutton Energy Complex consists
3 of two CTs and one steam turbine. The six CC power blocks are equipped with SCR
4 equipment, and all nine CTs have low NO_x burners. The steam turbines do not combust fuel
5 and, therefore, do not require NO_x controls. The Company's hydro fleet consists of 15 units
6 providing 228 MWs of capacity. The Company's solar fleet consists of four sites providing
7 35 MWs of dependable capacity.

8 **Q. WHAT NOTABLE CHANGES HAVE OCCURRED WITHIN THE**
9 **FOSSIL/HYDRO/SOLAR PORTFOLIO SINCE DEP'S 2020 ANNUAL FUEL**
10 **PROCEEDING?**

11 A. Darlington CT Units 1, 2, 3, 4, 6, 7, 8, and 10 were retired in March 31, 2020.

12 **Q. WHAT ARE DEP'S OBJECTIVES IN THE OPERATION OF ITS**
13 **FOSSIL/HYDRO/SOLAR FACILITIES?**

14 A. The primary objective of DEP's Fossil/Hydro/Solar generation department is to provide safe,
15 reliable and cost-effective electricity to DEP's customers. Operations personnel and other
16 station employees are well-trained and execute their responsibilities to the highest standards
17 in accordance with procedures, guidelines, and a standard operating model. Like safety,
18 environmental compliance is a "first principle," and DEP works very hard to achieve high
19 level results.

20 The Company achieves compliance with all applicable environmental regulations and
21 maintains station equipment and systems in a cost-effective manner to ensure reliability. The
22 Company also takes action in a timely manner to implement work plans and projects that
23 enhance the safety and performance of systems, equipment, and personnel, consistent with

1 providing low-cost power options for DEP's customers. Equipment inspection and
2 maintenance outages are generally scheduled during the spring and fall months when
3 customer demand is reduced due to milder temperatures. These outages are well-planned and
4 executed with the primary purpose of preparing the unit for reliable operation until the next
5 planned outage.

6 **Q. HOW MUCH GENERATION DID EACH TYPE OF GENERATING FACILITY**
7 **PROVIDE FOR THE REVIEW PERIOD?**

8 A. For the review period, DEP's total system generation was 59,183,366 megawatt-hours
9 ("MWHs"), of which 29,869,431 MWHs, or approximately 50%, was provided by the
10 Fossil/Hydro/Solar fleet. The breakdown includes a 36% contribution from gas facilities,
11 13% contribution from coal-fired stations, 2.0% contribution from hydro facilities, and 0.4%
12 from solar facilities.

13 The Company's portfolio includes a diverse mix of units that, along with its nuclear
14 capacity, allows DEP to meet the dynamics of customer load requirements in a logical and
15 cost-effective manner. Additionally, DEP has utilized the Joint Dispatch Agreement with
16 DEC, which allows generating resources for DEP and DEC to be dispatched as a single system
17 to enhance dispatching at the lowest possible cost. The cost and operational characteristics of
18 each unit generally determine the type of customer load situation (e.g., base and peak load
19 requirements) that a unit would be called upon or dispatched to support.

20 **Q. HOW DID DEP COST EFFECTIVELY DISPATCH THE DIVERSE MIX OF**
21 **GENERATING UNITS DURING THE REVIEW PERIOD?**

22 A. The Company, like other utilities across the U.S., has experienced a change in the dispatch
23 order for each type of generating facility due to continued favorable economics resulting from

1 the lower pricing of natural gas. Further, the addition of new CC units within DEP's portfolio
2 in recent years has provided DEP with additional natural gas resources that feature state-of-
3 the-art technology for increased efficiency and significantly reduced emissions. These factors
4 promote the use of natural gas and provide real benefits in cost of fuel and reduced emissions
5 for customers. Gas-fired facilities provided 71% of the DEP Fossil/Hydro/Solar generation
6 during the review period.

7 **Q. WHAT WAS THE HEAT RATE FOR DEP'S COAL-FIRED AND COMBINED**
8 **CYCLE UNITS DURING THE REVIEW PERIOD?**

9 A. Heat rate is a measure of the amount of thermal energy needed to generate a given amount of
10 electric energy and is expressed as British thermal units ("Btu") per kilowatt-hour ("kWh").
11 A low heat rate indicates an efficient fleet that uses less heat energy from fuel to generate
12 electrical energy. Over the review period, the Company's five coal units produced 25% of
13 the Fossil/Hydro/Solar generation, with the average heat rate for the coal-fired units being
14 11,455 Btu/kWh. The most active station during this period was Roxboro, providing 85% of
15 the coal production for the fleet with a heat rate of 10,982 Btu/kWh. During the review period,
16 the Company's six combined cycle power blocks produced 66% of the Fossil/Hydro/Solar
17 generation, with an average heat rate of 7,171 Btu/kWh.

18 **Q. PLEASE DISCUSS THE OPERATIONAL RESULTS FOR DEP'S**
19 **FOSSIL/HYDRO/SOLAR FLEET DURING THE REVIEW PERIOD.**

20 A. The Company's generating units operated efficiently and reliably during the review period.
21 Several key measures are used to evaluate the operational performance depending on the
22 generator type: (1) equivalent availability factor ("EAF"), which refers to the percent of a
23 given time period a facility was available to operate at full power, if needed (EAF is not

1 affected by the manner in which the unit is dispatched or by the system demands; it is
2 impacted, however, by planned and unplanned maintenance (*i.e.*, forced) outage time); (2) net
3 capacity factor (“NCF”), which measures the generation that a facility actually produces
4 against the amount of generation that theoretically could be produced in a given time period,
5 based upon its maximum dependable capacity (NCF *is* affected by the dispatch of the unit to
6 serve customer needs); (3) equivalent forced outage rate (“EFOR”), which represents the
7 percentage of unit failure (unplanned outage hours and equivalent unplanned derated hours);
8 a low EFOR represents fewer unplanned outage and derated hours, which equates to a higher
9 reliability measure; and, (4) starting reliability (“SR”), which represents the percentage of
10 successful starts. For 2021, the Company is including another measure to assess plant
11 reliability—equivalent forced outage factor (“EFOF”)—which quantifies the number of
12 period hours in a year during which the unit is unavailable because of forced outages and
13 forced deratings.

14 The following chart provides operational results categorized by generator type, as well
15 as results from the most recently published North American Electric Reliability Council
16 (“NERC”) Generating Unit Statistical Brochure representing the period 2015 through 2019.
17 The NERC data reported for the coal-fired units represents an average of comparable units
18 based on capacity rating.

<i>Generator Type</i>	<i>Measure</i>	<i>Review Period</i>	<i>2015-2019</i>	<i>Nbr of Units</i>
		<i>DEP Operational Results</i>	<i>NERC Average</i>	
<i>Coal-Fired Test Period</i>	EAF	59.9%	80.1%	188
	NCF	26.5%	55.7%	
	EFOF	10.0%	n/a	
<i>Coal-Fired Summer Peak</i>	EAF	75.6%	n/a	n/a
<i>Total CC Average</i>	EAF	79.8%	84.9%	350
	NCF	62.9%	54.8%	
	EFOF	2.6%	n/a	
<i>Total CT Average</i>	EAF	83.8%	86.9%	746
	SR	98.4%	98.4%	
<i>Hydro</i>	EAF	70.3%	79.9%	1,060

Q. PLEASE DISCUSS SIGNIFICANT OUTAGES OCCURRING AT DEP'S FOSSIL/HYDRO/SOLAR FACILITIES DURING THE REVIEW PERIOD.

A. In general, planned maintenance outages for all fossil and hydro units are scheduled for the spring and fall to maximize unit availability during periods of peak demand. Most units had at least one short planned outage during this review period to inspect and maintain plant equipment.

Roxboro Unit 1 had a Spring outage, and the primary purpose was to complete the Dry Fly Ash Tie-in. Roxboro Unit 2 had a planned outage in Spring 2020. The primary purpose of the outage was for a major boiler outage, upgrade control systems, high-energy piping inspection, and control valve restoration. Roxboro Unit 4 had a planned outage in Spring 2020. This outage was conducted to replace ductwork and high-energy piping inspection. Mayo Unit 1 had a maintenance outage in Fall 2020. The outage scope included scrubber spread header repairs, mist eliminator tray cleaning and spray nozzle replacements, burner repairs, SCR cleanings, and repairs to Air Heater baskets. Roxboro Unit 3 had a

1 planned outage in Fall 2020. During this outage, the SCR catalyst layer was replaced, boiler
2 waterwall tubes were repaired and high energy piping inspections took place.

3 Asheville CC had Spring 2020 transmission outages to relocate transmission lines and
4 perform necessary warranty work. Smith Energy Complex CC Unit 4 had a Fall 2020 outage
5 to conduct a boroscope inspection on the combustion turbines and balance of plant
6 maintenance work.

7 The CT fleet performed planned outages on Darlington CT 12 and CT 13 in the Fall
8 of 2020. During these outages, turbine control hardware and software systems were replaced.

9 **Q. HOW DOES DEP ENSURE EMISSIONS REDUCTIONS FOR ENVIRONMENTAL**
10 **COMPLIANCE?**

11 A. The Company has installed pollution control equipment on coal-fired units, as well as new
12 generation resources, in order to meet various current federal, state, and local reduction
13 requirements for NO_x and SO₂ emissions. The SCR technology that DEP currently operates
14 on the coal-fired units uses ammonia or urea for NO_x removal and the scrubber technology
15 employed uses crushed limestone or lime for SO₂ removal. SCR equipment is also an integral
16 part of the design of the newer CC facilities in which aqueous ammonia (19% solution of
17 NH₃) is introduced for NO_x removal.

18 Overall, the type and quantity of chemicals used to reduce emissions at the plants
19 varies depending on the generation output of the unit, the chemical constituents in the fuel
20 burned, and/or the level of emissions reduction required. The Company is managing the
21 impacts, favorable or unfavorable, as a result of changes to the fuel mix and/or changes in
22 coal burn and utilization of non-traditional coals. Overall, the goal is to effectively comply
23 with emissions regulations and provide the optimal total-cost solution for operation of the

1 unit. The Company will continue to leverage new technologies and chemicals to meet both
2 present and future state and federal emissions requirements including the Mercury and Air
3 Toxics Standards (“MATS”) rule. MATS chemicals that DEP may use in the future to reduce
4 emissions include, but may not be limited to, activated carbon, mercury oxidation chemicals,
5 and mercury re-emission prevention chemicals. Company witness Harrington provides the
6 cost information for DEP’s chemical use and forecast.

7 **Q. DOES THAT CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

8 A. Yes, it does.